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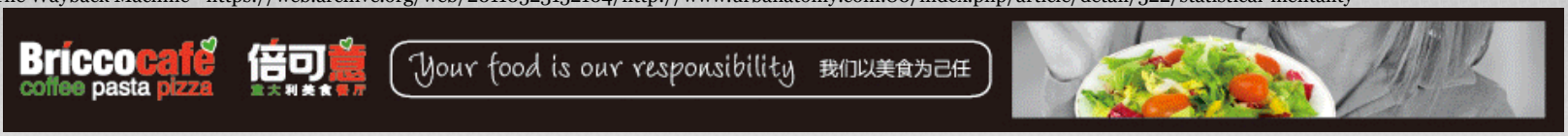

Statistical Mentality

by nickland @ Wednesday, 18 May 2011 17:17

Things are very probably weirder than they seem

As the natural sciences have developed to encompass increasingly complex systems, scientific rationality has become ever more statistical, or probabilistic. The deterministic classical mechanics of the enlightenment was revolutionized by the near-equilibrium statistical mechanics of late 19th century atomists, by quantum mechanics in the early 20th century, and by the far-from-equilibrium complexity theorists of the later 20th century. Mathematical neo-Darwinism, information theory, and quantitative social sciences compounded the trend. Forces, objects, and natural types were progressively dissolved into statistical distributions: heterogeneous clouds, entropy deviations, wave functions, gene frequencies, noise-signal ratios and redundancies, dissipative structures, and complex systems at the edge of chaos.

By the final decades of the 20th century, an unbounded probabilism was expanding into hitherto unimagined territories, testing deeply unfamiliar and counter-intuitive arguments in statistical metaphysics, or statistical ontology. It no longer sufficed for realism to attend to multiplicities, because reality was itself subject to multiplication.

In his declaration *cogito ergo sum*, Descartes concluded (perhaps optimistically) that the existence of the self could be safely concluded from the fact of thinking. The statistical ontologists inverted this formula, asking: given my existence (which is to say, an existence that seems like this to me), what kind of reality is probable? Which reality is this likely to be?

MIT Roboticist Hans Moravec, in his 1988 book *Mind Children*, seems to have initiated the genre. Extrapolating Moore's Law into the not-too-distant future, he anticipated computational capacities that exceeded those of all biological brains by many orders of magnitude. Since each human brain runs its own more-or-less competent simulation of the world in order to function, it seemed natural to expect the coming technospheric intelligences to do the same, but with vastly greater scope, resolution, and variety. The mass replication of robot brains, each billions or trillions of times more powerful than those of its human progenitors, would provide a substrate for innumerable, immense, and minutely detailed historical simulations, within which human intelligences could be reconstructed to an effectively-perfect level of fidelity.

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This vision feeds into a burgeoning literature on non-biological mental substrates, consciousness whole-brain emulations ('ems'), and Matrix-style artificial realities. Since the realities we presently (let us momentarily assume) on biological signal-processing systems with highly-finite quantitativ reason to confidently anticipate that an 'artificial' reality simulation would be in any way distingui

Is 'this' history or its simulation? More precisely: is 'this' a contemporary biological (brain-based) artificial memory, run on a technological substrate 'in the future'? That is a question without clas It can only be approached, rigorously, with statistics, and since the number of fine-grained simula probably vast), overwhelmingly exceeds the number of actual or original histories (for the sake of probabilistic calculus points unswervingly towards a definite conclusion: we can be near-certain tl simulation run by artificial (or post-biological) intelligences at some point in 'our future'. At least present themselves – we can be extremely confident, on grounds of statistical ontology, that our not historical reconstruction, it might be a game or fiction).

Nick Bostrom formalizes the simulation argument in his article 'The Simulation Argument: Why th Living in the Matrix is Quite High' (found here):

Now we get to the core of the simulation argument. This does not purport to demonstrate that yo it shows that we should accept as true at least one of the following three propositions:

(1) The chances that a species at our current level of development can avoid going extinct before mature is negligibly small

(2) Almost no technologically mature civilisations are interested in running computer simulations

(3) You are almost certainly in a simulation.

Each of these three propositions may be prima facie implausible; yet, if the simulation argument (it does not tell us which).

If obstacles to the existence of high-level simulations (1 and 2) are removed, then statistical reasc exact track laid down by Moravec. We are "almost certainly" inhabiting a "computer simulation tha advanced civilization" because these saturate to near-exhaustion the probability space for realitie simulations exist, original lives would be as unlikely as winning lottery tickets, at best.

Bostrom concludes with an intriguing and influential twist:

If we are in a simulation, is it possible that we could know that for certain? If the simulators don't probably never will. But if they choose to reveal themselves, they could certainly do so. Maybe a w fact would pop up in front of you, or maybe they would "upload" you into their world. Another eve with a very high degree of confidence that we are in a simulation is if we ever reach the point wh our own simulations. If we start running simulations, that would be very strong evidence against us with only (3).

If we create fine-grained reality simulations, we demonstrate – to a high level of statistical confide one, and that the history leading up to this moment of creation was fake. Paul Almond, an enthusi draws out the radical implication – reverse causation – asking: Can you retroactively put yourself in a

Such statistical ontology, or Bayesian existentialism, is not restricted to the simulation argument. discussions of the Anthropic Principle, of the Many Worlds Interpretation of Quantum Mechanics, and from the Doomsday Argument to Quantum Suicide (and Immortality).

Whatever is really happening, we probably have to chance it.

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